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"To the solid ground
Of Nature trusts the mind which builds for aye."—WORDSWORTH

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GEIKIE'S "LIFE OF MURCHISON"

Life of Sir Roderick I. Murchison, Bart., F.R.S. etc. Based on his Journals and Letters. With Notices of his Scientific Contemporaries and a Sketch of the Rise and Growth of Palæozoic Geology in Britain. By Archibald Geikie, LL.D., F.R.S., Director of H.M. Geological Survey of Scotland, and Murchison Professor of Geology and Mineralogy in the University of Edinburgh. 2 vols. Illustrated with Portraits and Woodcuts. (London: John Murray, 1875.)

TO have before us in detail, and reflected as in a mirror of his own notes and correspondence, the story of the life of one who has taken a foremost place in the ranks of science, is a matter of no little interest. We want to know as much as we can of the kind of qualities that go to make a successful man of science, and of the circumstances which have enabled him to be useful to the world. Such information may be obtained either by categorical questions addressed to such men during life, after the manner of Mr. Francis Galton's work lately reviewed in these columns,* in which we have the advantage of numbers for comparison; or by the more detailed story of the life of individuals, from which we can gather for ourselves the answers to our questions, with all the additional light thrown upon them by surrounding circumstances.

Such a story is that presented to us by Prof. Geikie of the life of Sir Roderick Murchison, whom no one will deny to have occupied a foremost place, and to have contributed valuable and lasting materials to the sciences to which he devoted himself. Many, indeed, and fruitful are the teachings of such a life as this, and some of them are well pointed out by the author in his concluding lines.

Nor is the interest of the work confined to this. Not only was Murchison eminent in science, but he ranks among the founders of one of its most recent branches—Geology; and hence, though in later years his name has been more prominently connected in the public mind with Geography, it is as a geologist alone that he will be known to posterity; and the study of his life is an examination of the way in which some of the chief corner-stones of Geology were laid.

Prof. Geikie has performed his promised task in an admirable manner. It must be remembered that he was asked by the subject himself to undertake the work, and the materials out of which he was to develop it were placed in his hands; and under these circumstances he must necessarily be guided partly by the probable wishes of the subject, and partly by the nature of his material; and if it be a biographer's duty to "hold a mirror up to nature," there can be no doubt that Prof. Geikie has admirably done so. The scenes and circumstances that formed so large a part of the acted life may well occupy an equally large share in the written life, however much geologists or students of human nature might wish for different matter.

We have no doubt that Prof. Geikie would have preferred to write such a life as we have indicated, and he has done his best to escape from a "narrative devoted merely to the personal events of Sir Roderick Murchison's life;" but in loyalty to his friend he felt bound, no doubt, to follow his desires rather than his own. Those who are acquainted with Prof. Geikie's other writings need not be told that this is written with admirable perspicuity, and his candour and ingenuousness are above all praise. There is no false colouring here; we see Murchison as he was; what was good not exaggerated, but duly brought forward; what was bad (and who has not faults?) by no means palliated, though, where possible, accounted for. These are undoubtedly the great merits of the work, and ought to inspire thorough confidence where it touches on matters of controversy.

The Life before us gives admirable means of perceiving the exact relation of Sir Roderick Murchison to the science of Geology, and the qualities and circumstances which enabled him to stand in that relation. There are times in the history of a Science, as in the history of a Nation, when some definite work has to be done, and it is done, as we may say, through some power of natural selection, by one whose qualities are adapted for that purpose and for that alone, and whose greatness consists in being exactly fitted in that respect to the time in which he lives, and it may be in nothing besides. Before we consider the relation which Murchison held in this way to Geology, we may pass in review the chief incidents of his life as detailed for us in these volumes.

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* NATURE, vol. xi. p. 161.

Sir Roderick was descended from a sturdy Highland stock, whose courage and perseverance he inherited, but who contributed no further to his fortune. His father was a surgeon, who, after making a fortune in India, returned to his native land and bought the estate of Tarradale, in the eastern part of the county of Ross, where Roderick was born on Feb. 19, 1792. When the boy was only three years old the family removed to Bath, where the father died in 1796. Three years after, Roderick's mother married a second time, and the boy, at the age of seven years, was sent to the grammar school of Durham. Here he seems to have learnt little but mischief; but educational requirements were not great in those days, and he probably knew at the end of his six years as much as most of his contemporaries. Certainly his education here had no manner of influence, as far as we can see, on his future career; and the absence of scientific culture in youth, if it did not prevent him from rising to greatness and doing good work, would most decidedly have done so had he been thrown into other circumstances and lived in days like our own, and it certainly confined him to the limits of a geological worker instead of allowing him to become a geological philosopher.

After leaving Durham, and visiting his uncle, General Mackenzie, who persuaded him he would make a good soldier, he was sent to the military college at Great Marlow. The two years he spent here cannot be said to have been without use to him, for if he learnt but little from books, he was forced to undergo the more special training for a soldier's career, which in after life had a solidifying effect on his character. At this time his uncle wrote of him: "He is a charming boy, manly, sensible, generous, warm-hearted. I think he has talents to make a figure in any profession." At the age of fifteen he was gazetted Ensign in the 36th Regiment, which, after picking up some scraps of knowledge in Edinburgh, he joined in Ireland. He had not long to wait for work, for in the following year (1808) his regiment was ordered to the Peninsula, and he received his "baptism of fire" at the battle of Vimieira. We need scarcely say of any English soldier that he behaved with bravery in battle, and fortitude under trying circumstances: but, after a short display of these qualities, a retreat was ordered from Corunna, and Murchison returned home, being nearly wrecked in the transport. Though he joined his uncle Mackenzie as aide-de-camp in the following year, he never again succeeded in getting into active service, and this induced him, after eight years' career, to retire from the army.

Murchison was evidently a keen soldier, and it seems probable that, had he found adequate scope for the irrepressible energy of his character in this direction, Geology would have lost his services. At the age of twenty-three, on August 29, 1815, he married Miss Charlotte Hugonin, daughter of General Hugonin, of Nursted House, Hampshire; an event which had a more than usual influence on his future career. In the first place, her fortune, combined with his own, enabled him to devote himself to any pursuit he might take up, without having the distractions of bread-winning routine duties, and in later years to keep up that state and hospitality which made him the representative of science in the upper circles of society. But also, and to her honour, she exercised a most salutary personal influence over him, almost imperceptible, but always in the right direction. Prof. Geikie says, "to his wife he owed his fame;" but a perusal of his life assures us that this must be taken in a very qualified sense. Such a steady attachment to science as he showed for more than forty years argues a natural bent that way that would sooner or later have been developed under any circumstances; yet at one time certainly she was his "*better* half," and her influence deserves all admiration. It was soon after his marriage that he retired from the army, chiefly to avoid introducing his wife to the monotony of barrack life. What pursuit was he to follow now? Something it must be that, while it would not engross too much time and effort, would leave him plenty of scope for the satisfaction of that muscular energy which was continually craving for some adequate outlet. Should he become a country parson, trudging for miles over the wild country side to visit some outlying houses, varying his duties occasionally by a fox-hunt or a day's shooting? He actually thought of this; but his creed, as given in his own words by his biographer, shows that this was really an impossible solution of the question. So he tried travel; and for two years roamed over Italy and examined the treasures of art with a quickly ripening critical eye. His enthusiasm in this pursuit, which was quite new to him, proved how vast was his energy, and that it only required guidance into a suitable channel to accomplish valuable work. But he found out in time that art was not his calling; and, tired of continental travel, he brought back his wife to England. Then there was nothing but fox-hunting that he could think of to employ his energies; so he spent five of the best years of his life, from twenty-six to thirty-one, in this important occupation, and succeeded in gaining the glorious distinction of being the best rider in his neighbourhood.

But the wild oats were sown at last, and partly from *ennui*, partly from meeting with Sir Humphry Davy, and greatly from the influence of his wife, he once more looked the question in the face—Was there no employment that would be worthy of a man of energy, that would require and repay his enthusiasm?

At that time (1825) Geology was in need of such a man as he. Some few years before the Geological Society had been started, and its principle was this: "In the present state of geological science, facts are more wanted than theories." Now, while the facts of most other sciences are obtained in the closet, many of those of geology are to be gathered in the field. Prof. Geikie gives in this connection a pleasant outline of the state of theoretical geology of the time, on some details of which there may possibly be difference of opinion, but it is certain that no sound progress could be made on account of the backwardness of stratigraphical geology; almost the only good work as yet done in this direction being that of Wm. Smith—a man considerably like Murchison in character, though in a lower walk of life, and who had mapped and arranged most of what we now call secondary rocks. Much remained yet to be done both among these and above them, but below them was a perfect blank. No one had yet attempted to attack the monster "Grauwacke" in his fastnesses. It was not, however, to be conquered by a tyro, and it was only after minor attempts elsewhere that Murchison made the assault upon it from above, while Sedgwick undermined it from below.

Murchison's life hitherto has not been such as to lead us to expect much of him; but a study of his biography and a knowledge of his works prove that we must from this time see him in a different light; without indeed the advantages of early training, yet earnestly doing his best under the circumstances to advance the cause of science in that way in which alone he could hope to do so. He was one of those who

> "rise
> On stepping-stones of their dead selves
> To higher things;"

and we next hear of him as a diligent student of Brande, Buckland, Webster, and Wollaston, and very shortly following out, at the suggestion of others, some new lines of inquiry, where information was wanted. The discussion of these works we will postpone for the present, and pass on to the sketch of his life henceforth as detailed for us so clearly by Prof. Geikie.

His first excursion was in the summer of 1825, when he was accompanied by his wife, and made a tour of nine weeks on the south coast, from the Isle of Wight into Devon and Cornwall. "Driving, boating, walking, or scrambling, the enthusiastic pair signalised their first geological tour by a formidable amount of bodily toil."

Murchison associated himself early in his geological career with Sedgwick, with whom he had many a happy and profitable tour, the first of which took place in 1827, when they went together to the Island of Arran. Murchison's summers for many years now were spent in the field, while his winters in London were given to society, and to the work of the Secretary of the Geological Society, which he voluntarily undertook. It was not till 1831 that he first broke ground in "Siluria," the results of which appeared after many delays, in 1838, in the well-known "Silurian System." He was not content with work in England only, but quite as often traversed the Continent, bringing home results, and enjoying the society of the chiefs of geology abroad. No sooner was his first work well off his hands than he began to contemplate an excursion to Russia to trace the same rocks there, and having been partially successful in 1840, the next year he surveyed the whole of the Ural Mountains under the auspices of the Emperor, and with the assistance of Count Keyserling and De Verneuil, the results of which survey appeared in 1845 in the magnificent work entitled "Geology of Russia and the Ural Mountains."

From this time Murchison's position in the ranks of geologists was secure. How did he use it? To this there can be but one answer. He used all the influence his position gave him for the advancement of science. His personal energies never flagged; no summer passed but he did good work, which now forms part of the common property of geologists. Each autumn saw him enthusiastically engaged in the work of the British Association, of which he was president in 1846, and in which he ever continued to take a genuine interest. During these years his devotion to the Geographical Society increased, and, as our readers know, he was in the end regarded as so indispensable to its prosperity, that for the last ten years of his life he was president.

This Society was almost of his own making, for it was a very different thing when he joined it to what it was when he died; and perhaps some little feeling of jealousy may be entertained by geologists at the apparent transference of his affections. But it should be remembered that throughout his career Murchison was a pioneer. His works are all masterly outlines of fresh fields; and when by the time that infirmities in any case would prevent him from doing much field-work, he found a large band of geologists working at details throughout Europe. No room was left for such preliminary investigations as his, unless he went by proxy, so to speak, to countries far away; and in the end he was strictly serving Geology, by encouraging Physical Geography; for the former is impossible without the foundation of the latter being laid.

As Director-General of the Geological Survey, a post which he held from the death of Sir H. De la Beche in 1855 until his own decease in 1871, he earned the gratitude of geologists by the enlarged scope he persuaded the Government to give to it, and its consequent rapid and invaluable work; while in this and in other ways he was always ready and anxious to help forward any rising worker in the field.

Into further details of his life—how honours were poured on him from all sides, which he received with avidity; how he never failed to enjoy the delights of society; how he obtained a Geographical Section at the British Association; how he endowed a professorship of Geology—into these we cannot enter more fully, but must refer the reader to the book itself, where they are all admirably set forth.

The last words of Prof. Geikie on the character of Sir Roderick Murchison are very good. He traces the success of his career and the value of his life to three main sources. "Foremost we would place his vigorous energy, his unwearied and almost reckless activity. He never seemed to be without a definite and well-planned task." "Another leading feature in his character . . . was shrewd common sense and knowledge of the world;" and "there was still another characteristic which secured to Murchison the esteem as well as the respect of his fellow-men—his thorough kindliness and goodness of heart." Every one of these features is amply illustrated in the details of his life; and though other features, perhaps not quite so imitable, may strike us on its perusal, yet these stand out in the foreground, and teach the ever-required lesson that industry and energy are the invariable forerunners of success. (*To be continued.*)

THE FLORA OF BRITISH INDIA

The Flora of British India. By Dr. J. D. Hooker, C.B., assisted by various Botanists. Vol. I. Ranunculaceæ to Sapindaceæ. (London: Reeve and Co.)

THE completion of the first volume of the Flora of India is an event of no small importance in descriptive botany. That India should be almost the last of our